



Issues and Opinions

YouTube's growth in use among children 0–5 during COVID19: The Occidental European case

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ABSTRACT

YouTube has become an educational and entertainment tool among Western European families, particularly during the COVID-19 pandemic. This study monitored the main channels for children aged 0–5 years by using the social media analysis (SNA) methodology from March 24, 2020 to August 24, 2020. The software used has been FanpageKarma, which allows the collection and interpretation of data. The results indicate not only a growth in the use of such channels during confinement, but also how their expansion is related to the evolution of the COVID-19, reflecting, in turn, the consequences of the government policies adopted. Social distancing generated a greater consumption of recreational content, but not a greater growth in educational content regardless of the country or culture.

1. Introduction

The COVID-19 pandemic has forced all of humanity to take action to prevent the spread of the virus. Among the different decisions taken, some states have opted for the confinement and closure of educational establishments, from early childhood to university education.

The measures taken by nations have varied both in their implementation and in their philosophy and timing (see Table 1). Differences in the communication of health measures can lead to changes in behaviour among the population [1], and it has proved crucial that a clear path be charted since the beginning of the pandemic [2]. Bearing in mind that personality variables imply disparate coping strategies, it is essential that the state takes generic measures that prevent traits such as neuroticism from being reinforced, while at the same time raising awareness and kindness, for example encouraging the population to take responsibility for the prevention of COVID-19 or showing gratitude for the population's efforts [3,4].

In the specific area of education, the measures taken have been noteworthy for the reduction in face-to-face teaching, the growth in online education (centralising resources through ministerial websites) and the prevalence of social isolation in Western Europe [5–7].

However, there have been divergences regarding the length of the school calendar [8,9] and the evaluation system used [10].

Families during this pandemic must not only care for their children by offering them a friendly environment [11], but also care for sick family members [12,13] who are particularly vulnerable to the coronavirus. In addition, those in vulnerable socioeconomic situations and with children under the age of five are more likely to experience anxiety and psychosocial distress [14]. During confinement, Chinese families reported that symptoms of hyperactivity and neglect increased in their children, leading to family discomfort [15]. To this situation, we must add 'the fear of COVID-19' variable, the only predictive factor that appears to stimulate a change in behaviour [16,17] as well as individual variables such as personality, morality and ideology, which all influence the population's decision making [3,4].

Families have tried to adapt to the new reality by making available to their children activities that favour well-being, health promotion habits (hand washing, use of masks, etc.) [18] and physical activity [19]. It is common for both parents and other adults to offer YouTube music videos (singing games, lullabies, stories, etc.) to children [20] for short periods of time [21,22]. In fact, new information and communication technologies (ICT) have been identified as tools of upbringing, as they

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allow distraction and even punishment or reward [23], or in Giddens' [24] terms, represent shell institutions, where technology occupies the role of care in the family. The use of channels such as BabyBus or Pororo Habit Game, which can capture the interest of the youngest, is especially noteworthy [25]. YouTube is a source of engaging educational music resources for young children [26]. Most parents regard this social network as an interesting support both for learning new rhymes, songs and words and for establishing sleep routines [26]. As for the consumption tastes of children under five, the answer is unambiguous. They are attracted to videos with human-talking songs, full of colour and with different scenes. They also like to touch the screen and hold the devices in their hands [22]. In fact, children in early childhood education today use smartphones and tablets on a regular basis, these being their main channels of access to the Internet [27,28]. It is understandable that children from 0 to 5 years of age preferably use small devices, because following Montessori's basic principles, accessibility and handling through fine psychomotor skills of the hands is necessary and indispensable in an infant's learning [29–31]. However, they still prefer videos with real people and objects that they recognise in their daily lives, as observing human interactions in their environment is one of the key evolutionary milestones of this age [32,33]. On the other hand, Yadav et al. [22] have shown how among children aged six to 24 months, YouTube videos have no educational function and merely entertain, an argument with which Genc [34] concurs. In addition, consuming children's videos is not a preferred task among the youngest, as they instead tend to prioritise playing and interacting with their environment [35]. Social distancing coupled with mobility restriction measures [7] and online education have limited children's interactions and consequently the play spaces that they share with other children during the pandemic [36–38].

Social networks have allowed people to interact telematically with their loved ones and even say 'goodbye' to them, attend funerals where necessary, keep informed about prevention and treatment measures, enjoy culture and carry out co-operative behaviour [39–41]. The growth in social network consumption among adults [42] may have its counterpart in childhood. This situation could contemplate the growth in the

consumption of children's channels both for learning and entertainment. However, one should not forget the cultural differences that exist among European nations [43]. In fact, the European Commission's [44] Digital Economy and Society Index (DESI), a composite index that summarises indicators analysing Europe's digital performance, may be used to study the digital competitiveness of European nations. It can be observed that the DESI during the calendar year 2020 registered variations among different nations according to performance indicators such as 5G readiness (a nation's readiness for mobile connection), video on demand (new on-demand TV platforms) and social media consumption (see graph 1).

The research questions that arise following the measures of social confinement and distancing imposed by the main powers in Western Europe are as follows. Has the consumption of YouTube channels aimed at early childhood increased during the COVID-19 pandemic? Are there differences in the consumption of children's YouTube channels in accordance with the measures implemented? What types of resources have been consumed the most? Has the consumption of educational content increased or, on the contrary, has the consumption of playful content taken precedence?

Therefore, the aim of this study is to carry out a longitudinal investigation monitoring the main YouTube channels aimed at early childhood (0–5 years) during the development of the COVID-19 pandemic in Western Europe and to answer the above questions.

The following hypotheses are advanced:

H1. There has been an international growth in the use of children's YouTube channels (educational and entertainment) during the period analysed.

H2. The growth in the use of YouTube is greater in those countries with the highest number of diagnosed cases, but it is possible to find differences between educational and entertainment channels.

H3. There are significant differences in the typology of videos (educational and entertainment) consumed among cultures.

Proximity to a disaster or crisis site increases people's consumption

Table 1
Chronogram of actions.

	Confinement of the population	Closure of non-essential establishments	School closures
Spain	March 15, 2020–May 11, 2020 Start and end of containment phases. March 15, 2020–June 20, 2020 Start and end of the alarm state. April 26, 2020 Children can go for a walk for 1 h a day.	March 30, 2020–April 09, 2020 Essential services. May 11, 2020 Re-opening of bars and terraces.	March 12, 2020: not opened.
France	March 17, 2020–May 11, 2020 Start and end of progressive containment. 24-03-2020 – July 10, 2020 Start and end of the state of health emergency.	March 14, 2020–June 01, 2020 Essential services. June 02, 2020 Re-opening of bars and terraces 50%.	March 16, 2020–May 12, 2020 With restrictions. June 22, 2020 Return to normal attendance.
Italy	February 23, 2020–May 04, 2020 Start and end of containment. January 31, 2020–October 15, 2020 State of sanitary alarm.	March 12, 2020–May 18, 2020 Essential services. June 1, 2020 Re-opening of bars and terraces	March 04, 2020: not opened.
Germany	No state of alarm or similar has been declared. The population was confined by areas according to outbreaks. General limitations in place (hygiene measures and social distancing). The measures lasted until May 03, 2020.	March 13, 2020–April 20, 2020 Spaces up to 800 square metres.	March 13, 2020–May 04, 2020 The first centre is closed and its dates vary by region according to the political model of the country.
United Kingdom	March 23, 2020–May 07, 2020 Regulation through the new coronavirus law, effective for two years.	March 20, 2020–July 04, 2020 Essential services July 04, 2020 Re-opening of bars and terraces.	March 18, 2020–June 01, 2020 *Just England.

of social networking sites [45,46]. Moreover, during the COVID-19 pandemic, families have had to care not only for their children but also for the sick [12,13]. Accordingly, countries that have had higher numbers of cases are likely to show greater consumption of YouTube videos, as these apps are used as entertainment and educational tools. The requirement to respond to educational needs has led to the use of social networking sites as educational channels, encouraging the consumption of educational resources [6,47,48]. YouTube has established itself as a tool for early childhood, as it encourages the reinforcement of behaviours [23] through the use of videos with musical songs, lullabies,

or musical stories [26]. Therefore, many parents use this tool with children under five years of age [20–22]. Children's interest at these stages appears to be developmental rather than cultural or gendered. The state of the art indicates how they exhibit interest towards content with human speech, bright colours and scene sequences and demonstrate their ability to grasp the electronic device with their hands [22].

Table 2

Distribution of the number of monitored channels.

Channel	Views	Fans	Number of 'likes'	Daily growth (in %) ^a	Nation	Objective	Age	Intelligence and competencies
Kinderlieder zum Mitsingen und Bewegen	6,996,370	1,780,000	17,696	5.95%	Germany	Educational	0–3	Musical and kinaesthetic
Peppa Pig Deutsch - Offizieller Kanal	51,381,036	1,170,000	194,994	13.59%	Germany	Entertainment	4–6	Language and social behaviour
KinderKlubTV	4,288,026	692,000	11,051	10.02%	Germany	Educational	4–6	Musical and kinaesthetic autonomy
Cartoons for Children	630,968	300,000	2663	4.53%	Germany	Entertainment	4–6	Language and social behaviour
Ben and Holly's Little Kingdom	2,073,355	134,000	6708	9.84%	Germany	Entertainment	4–6	Language and social behaviour
abclieder	8,200,000	7870	104,629	1.42%	Germany	Educational	0–3	Language and social behaviour
Pocoyo	99,667,790	8,460,000	533,078	9.3%	Spain	Entertainment	4–6	Language and social behaviour
Pica - Official Pica	11,019,523	8,290,000	55,209	8.22%	Spain	Educational	4–6	Musical and kinaesthetic autonomy
ChuChuTV English	3,335,616	7,850,000	15,484	10.25%	Spain	Educational	0–3	Musical and kinaesthetic autonomy
TiempodeSol	5,726,186	7,070,000	43,522	23.6%	Spain	Educational	0–3	Musical and kinaesthetic autonomy
CantaJuegoVEVO	3,118,635	6,880,000	11,287	12.97%	Spain	Educational	0–3	Musical and kinaesthetic autonomy
Happy Learning Spanish	1,277,610	1,150,000	13,072	68.13%	Spain	Educational	0–3	Language and autonomy
disneychannelES	2,760,279	2,540,000	38,334	11.4%	Spain	Entertainment	4–6	Language and social behaviour
Madame Récré FR	6,492,372	3,150,000	46,765	7.88%	France	Entertainment	4–6	Language and social behaviour
Démo Jouets	1,322,007	1,190,000	22,717	0.85%	France	Entertainment	4–6	Language and social behaviour
Toumi Toys	388,500,000	691,000	73,815,208	7.3%	France	Entertainment	4–6	Language and social behaviour
TuTiTu français	452,866	486,000	394	0.05%	France	Educational	0–3	Musical and kinaesthetic autonomy
DisneyChannelIT	2,624,453	2,280,000	7343	13.43%	Italy	Entertainment	4–6	Language and social behaviour
Canzoni Per Bimbi.it	6,103,606	1,410,000	35,387	12.8%	Italy	Educational	0–3	Musical and kinaesthetic autonomy
Peppa Pig Italiano - Canale Ufficiale	54,526,921	1,090,000	28,6721	16.58%	Italy	Entertainment	4–6	Language and social behaviour
Ben e Holly - Italian	2,535,502	249,000	14,278	11.16%	Italy	Entertainment	4–6	Language and social behaviour
PJ Masks Super Pigiamini - Canale Ufficiale	7,742,197	223,000	35,743	25.28%	Italy	Entertainment	4–6	Language and social behaviour
Gallina Puntolina	5,400,000	207,000	91,8501	0.07%	Italy	Educational	0–3	Musical and kinaesthetic autonomy
Masha and The Bear	187,604,070	1,6700,000	87,7261	24.63%	UK	Entertainment	4–6	Language and social behaviour
DisneyJuniorUK	28,726,430	8,490,000	76,731	14.73%	UK	Entertainment	4–6	Language and social behaviour
Disney UK	709,294	5,210,000	13,799	6.98%	UK	Entertainment	4–6	Language and social behaviour
Toy Trains 4u	2,769,537	3,520,000	774,412	0.28%	UK	Educational	0–3	Musical and kinaesthetic autonomy
ARPO The Robot	52,506,199	3,250,000	219,591	24.05%	UK	Educational	0–3	Language and autonomy
WildBrain - Kids Videos	11,568,733	2,930,000	44,711	13.57%	UK	Educational	4–6	Language and autonomy
Teletubbies - WildBrain	19,692,436	2,320,000	86,823	16.0%	UK	Entertainment	0–3	Musical and autonomy
The Official Pat & Stan	479,000,000	514,000	97,664	3.42%	UK	Entertainment	4–6	Language and social behaviour

^a Daily Growth (in %) is defined by Fanpage Karma as difference in number of fans in %, comparison of the first and the last day of the selected time period, average per day. See https://academy.fanpagekarma.com/en/hrf_faq/daily-growth-in/.

2. Material and methods

2.1. Data collection

The sample collected corresponds to the most representative accounts (number of fans) of children's channels (aimed at children aged 0–5 years) on YouTube from the main Western European powers: Germany, France, the United Kingdom (UK), Italy and Spain. The decision to opt for channels set up in these countries owes to the fact that they are first and foremost the main economic powers in Western Europe and represent the cultures of the Mediterranean (Spain and Italy), Central Europe (France and Germany) and the Anglo-Saxon world (UK). Furthermore, diverse measures have been implemented during the COVID-19 pandemic, the most restrictive tending to be in Spain and Italy (closure of schools from March and general confinement of the population) and the most lax in the UK, while intermediate situations have been implemented in France and Germany (adaptation of schools and social distancing). [Graph 2](#) presents the distribution of the sample through a colour map, in which the colours with the highest intensity correspond to the geographical areas for which the most views are available.

Those channels with the highest numbers of subscribers have been selected, excepting children YouTubers (intended for a child public, but of slightly older age). A total of 31 accounts with the largest numbers of followers are monitored in this study (see [Table 2](#)).

2.2. Instruments

The analysis and monitoring has been carried out using the Fanpage Karma application, a platform that allows the capture, monitoring and analysis of the content shared on the channels studied. The variables considered correspond to the so-called key performance indicators (KPI) [49], specifically visualisations, number of 'likes' and daily growth. This enables the analysis of the most shared videos as well as the most used word clouds.

The study of the development of COVID-19 has been carried out using European Centre for Disease Prevention and Control (ECDC) data. This European Union agency gathers the diagnostic data of COVID-19 considered official by nations around the world. However, the Centre has explained how the diagnostic criteria vary from country to country and it is possible to find discrepancies within the scientific community.

2.3. Procedure

The use of social networks enables the generation of a large volume of data that can be analysed and used to create valuable information [50, 51]. Moreover, in recent years researchers have paid greater attention to understanding the new relationships that have emerged as a result of the growth of social networks as well as the impact that contextual factors have on a given ecosystem [52,53].

In particular, this longitudinal study applies a methodology of social

network analysis, known in the academic literature as social media analysis (SNA), executed through the monitoring of YouTube channel accounts and the study of major KPIs [49]. The most used of KPI by the literature are those linked to the number of likes, number of retweets, commitment and number of fans [54].

This research has been carried out in three phases ([Fig. 1](#)): data collection, data analysis and interpretation of results. The monitoring period for the 31 YouTube accounts was from March 24, 2020 to August 24, 2020.

During this period it has been possible to study children's tastes in terms of interest in audiovisual content during the COVID-19 crisis. In this way, the growth in the use of these platforms can be determined as well as the accumulated and average numbers of fans, likes and publications and the sum of the impressions of the individual messages. In the same way, the clouds of words most used and the videos most consumed during this period are determined, allowing the detection of possible differences among cultures.

3. Results

The results of the research are presented below. As can be inferred from [Table 2](#), there has been an increase in the consumption of children's themes on YouTube in such a way that the channels with the greatest numbers of views are 'The Official Pat & Stan', 'Touni Toys' and 'Masha and The Bear', while those with the most followers (fans) are 'Masha and The Bear', 'DisneyJuniorUK' and 'Pocoyo'. However, those that have experienced the greatest daily growth are the educational channel 'Happy Learning Español' (68.13%), followed by the children's series 'PJ Masks Super Pigiamini - Canale Ufficiale' (25.28%) and 'Masha and The Bear' (24.63%).

On the other hand, it is relevant to notice how the growth of the channels can be affected by the measures of social distancing and even confinement put in place due to the spread of COVID-19. [Graph 3](#) shows the evolution of start channels during the health crisis and comparison to diagnoses of COVID-19 by types of channels and country where we see the period time (X axis), COVID-19 diagnoses (Yaxis on the left side) and average daily growth in educational channels (Y axis on the right side). The first column represents Educational channels and second one shows entertainment channels.

In all five nations there have been significant rises and falls and it is necessary to determine their wider contexts (see [graph 2](#)).

In Germany, there was a progressive drop from April 28, 2020 (one week after the opening of indoor spaces to 800 m²), with a reduction in consumption occurring from May 4, 2020 (cessation of strict distancing measures) to May 22, 2020, the day the long weekend was opened for the Christian Ascension Day (May 21, 2020). From this point on, consumption fell, before showing a slight rise at the end of July, coinciding with the second wave of outbreaks.

France is the nation whose consumption of children's channels seems to have been the most affected by the number of COVID-19 diagnoses. The highest rate of consumption occurred from March 24, 2020 to April

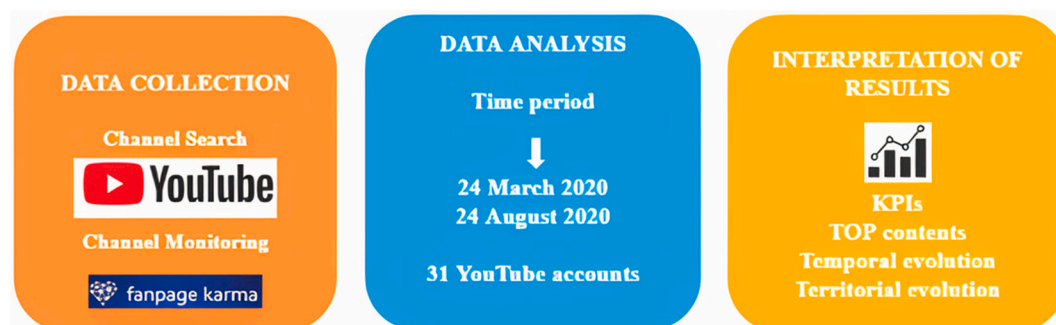


Fig. 1. Research phases.

15, 2020, in the middle of strict confinement. From that day on, the consumption rate remained stable until May, when it started to decrease, especially abruptly from May 11, 2020 (end of confinement). Its minimum was recorded on the day after Ascension Day, May 22, 2020. However, from this day onwards, a new growth in consumption began, a few days after a strong upturn in diagnoses (May 29, 2020). Consumption did not stop rising as COVID-19 diagnoses shot up, its peak being at the beginning of August, when pupils in infant education (*Maternelle*) were already on holiday.

In Italy, consumption was highest during the period of strict confinement (March 24, 2020 to May 4, 2020). From this day it began to decrease rapidly until May 11, 2020, this being the first week in which Italian families were able to go out into the streets. Until the end of May, there were small rises and recessions until May 22, 2020, although this did not coincide with any public holidays. From then on, the trend was downwards, with the lowest rates being recorded on June 2, 2020 (Italian Republic Day), June 21, 2020 and June 28, 2020. Although the lowest point of consumption occurred at the beginning of July (July 06, 2020), from this point onwards, a slow and progressive re-escalation of consumption started, again coinciding with the increase in COVID-19 diagnoses in the country.

Spain recorded its consumption peaks during full confinement (March 15, 2020 to May 11, 2020), although there was a reduction from April 26, 2020 (permission for families to walk for 1 h). The decrease was progressive, so that children seemed to gradually consume less online content. On May 11, 2020, the start of the de-escalation of the confinement was decreed, a date when a descent was registered, although it was not until Ascension Day (May 21, 2020) when the biggest and most pronounced drop was registered. Even though this is a religious celebration in the country, it is a working day (Thursday) rather than a bank holiday. Nevertheless, during these dates, most of the terraces were opened. The next important declines occurred in June (June 7, 2020 and June 10, 2020), from which a gradual decrease started, the minimum being reached on July 20, 2020. After this point a growth in consumption commenced, as the first contagions in the country emerged.

The most paradigmatic case is undoubtedly the UK, whose consumption seemed to be unrelated to the number of diagnoses. However, it did show similarities with its European counterparts, as on May 22, 2020 the country also recorded a significant drop. Consumption during the confinement of the population was fairly stable and began to decline with the arrival of the summer season, despite an upsurge in infections. However, at the end of June (June 23, 2020) it began to grow rapidly until August, when it decreased again.

Therefore, hypothesis 1 can be accepted due to the finding of a growth in the consumption of children's YouTube channels during confinement. On the other hand, this consumption showed reciprocity with the increase in diagnoses in the different countries, with the exception of the UK and Spain (hypothesis 2). In this way, we find that countries with clearer political measures and discourses such as Germany, France and Italy registered a growth in their channels similar to their numbers of COVID-19 diagnoses, unlike the UK and Spain.

Graph 4 is divided into ten quadrants, where represent scatter plot by countries and type of channels. These represent the relationship between educational daily growths average channels and COVID-19 diagnostics versus entertainment daily growths average channels and COVID-19 diagnostics. Each row represents a country: Germany (in orange), UK (in red), Italy (in blue), Spain (in yellow) and France (in green). R^2 , the squared correlation coefficient, explains the strength of the relationship between the two variables in the scatter plot.

The first quadrant is the upper left-hand corner of the graph 4, where we see COVID-19 diagnoses (X axis) and average daily growth in educational channels (Y axis) in Germany ($R^2 = 0.466$), a positive linear association. In the right-hand corner, we see COVID-19 diagnoses (X axis) and Entertainment Daily Growth Average Channels (Y axis), a positive linear association ($R^2 = 0.3433$). Italy shows similar behaviour.

A linear and positive growth is found especially in educational channels ($R^2 = 0.3342$) and to a lesser extent in entertainment channels ($R^2 = 0.2104$). In the cases of the UK and Spain, in the second and fourth rows respectively (in red and yellow) there is a very small and null relation ($R^2 = 0.012$ and $R^2 = 0.0729$; $R^2 = 0.0007$ and $R^2 = 0.0367$), respectively. In the last row, we can see France (in green). We observe a positive relation for both types of channels ($R^2 = 0.2901$ and $R^2 = 0.3665$, respectively).

As for the most viewed videos (see Fig. 2), the top 10 do not correspond to singing games or interactive songs with a human voice. The top 10 is instead entirely made up of children cartoons intended for early childhood, clearly highlighting the preference of 'Masha and The Bear'. In that case in all of them there are changes of scenes and the use of bright colours. If we analyse more closely the 5000 most followed children videos, that is to say, those with the greatest numbers of 'likes', we find that the channels with the greatest audience are those of cartoons (see Table 3), led by Disney (15.5%), WildBrain Kids Videos

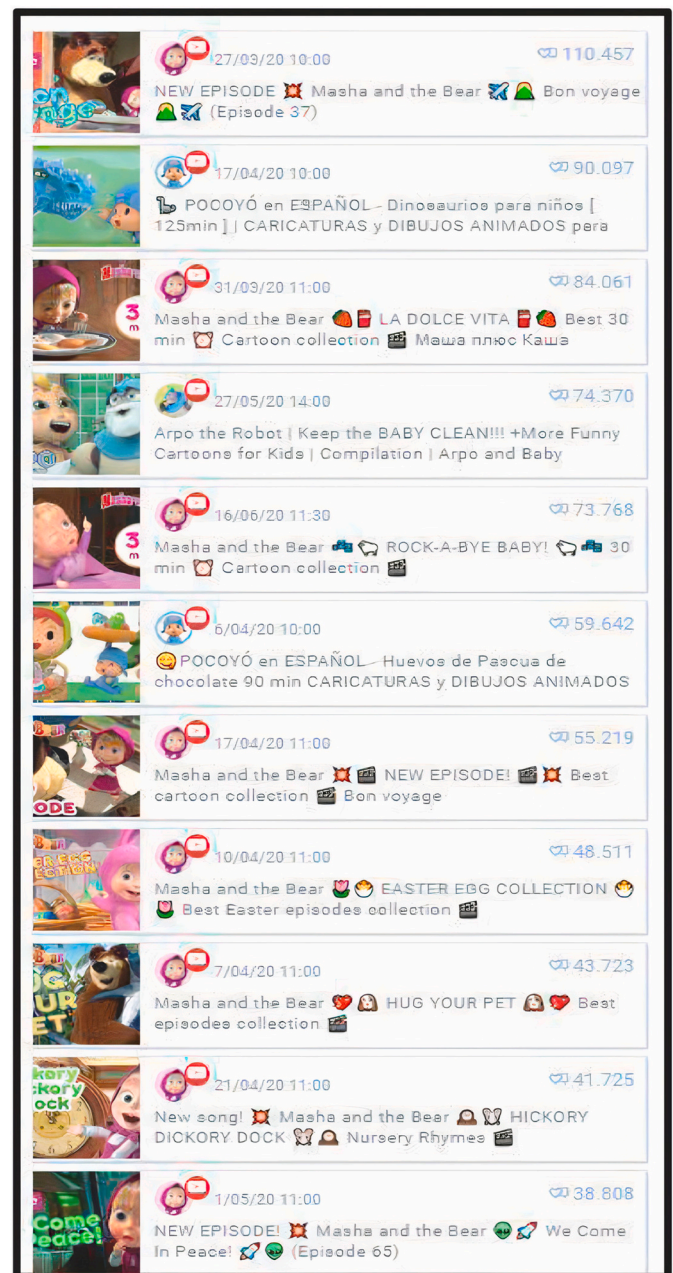
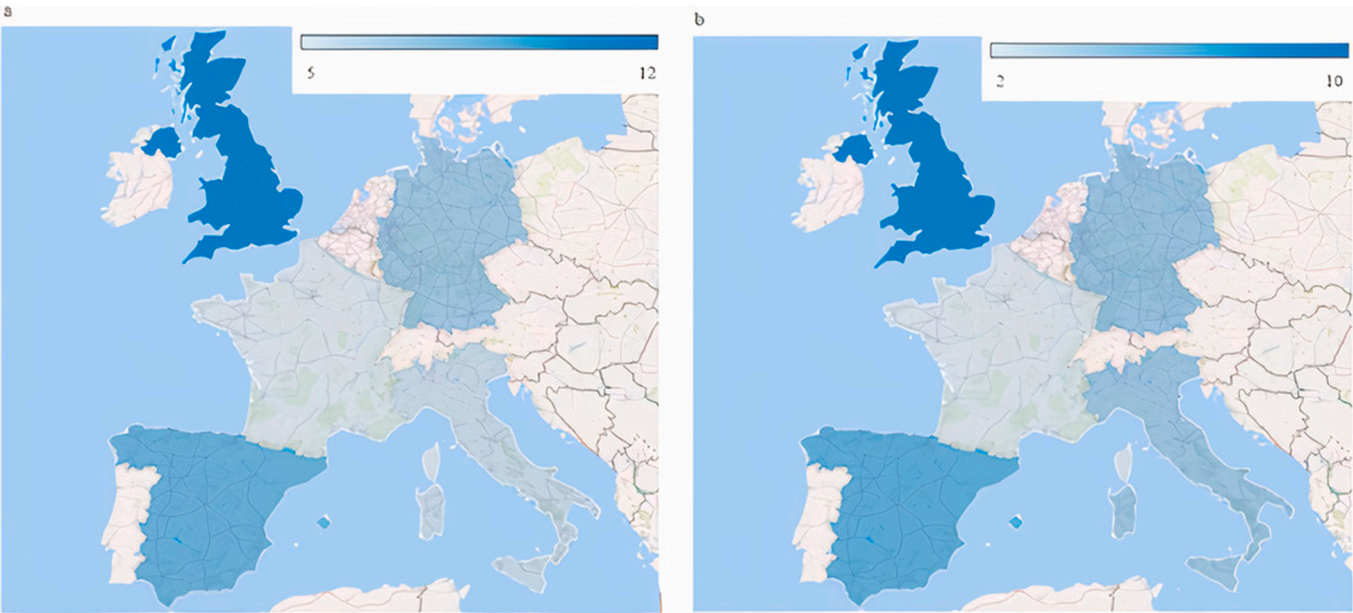
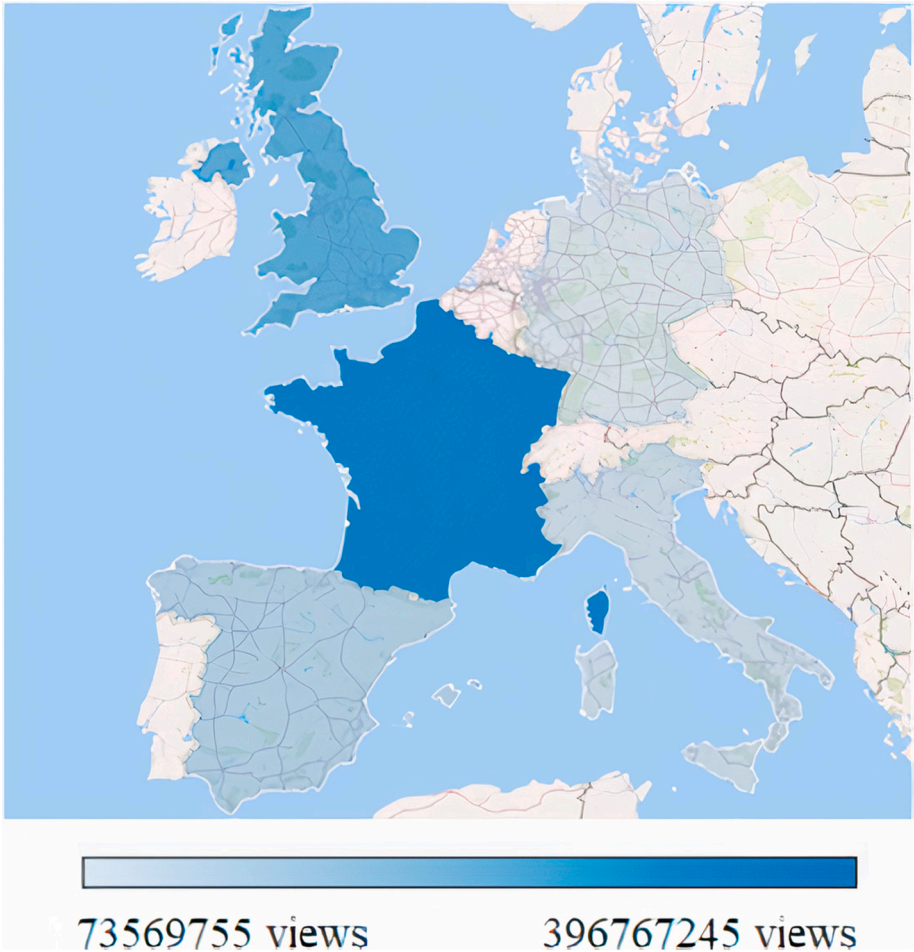


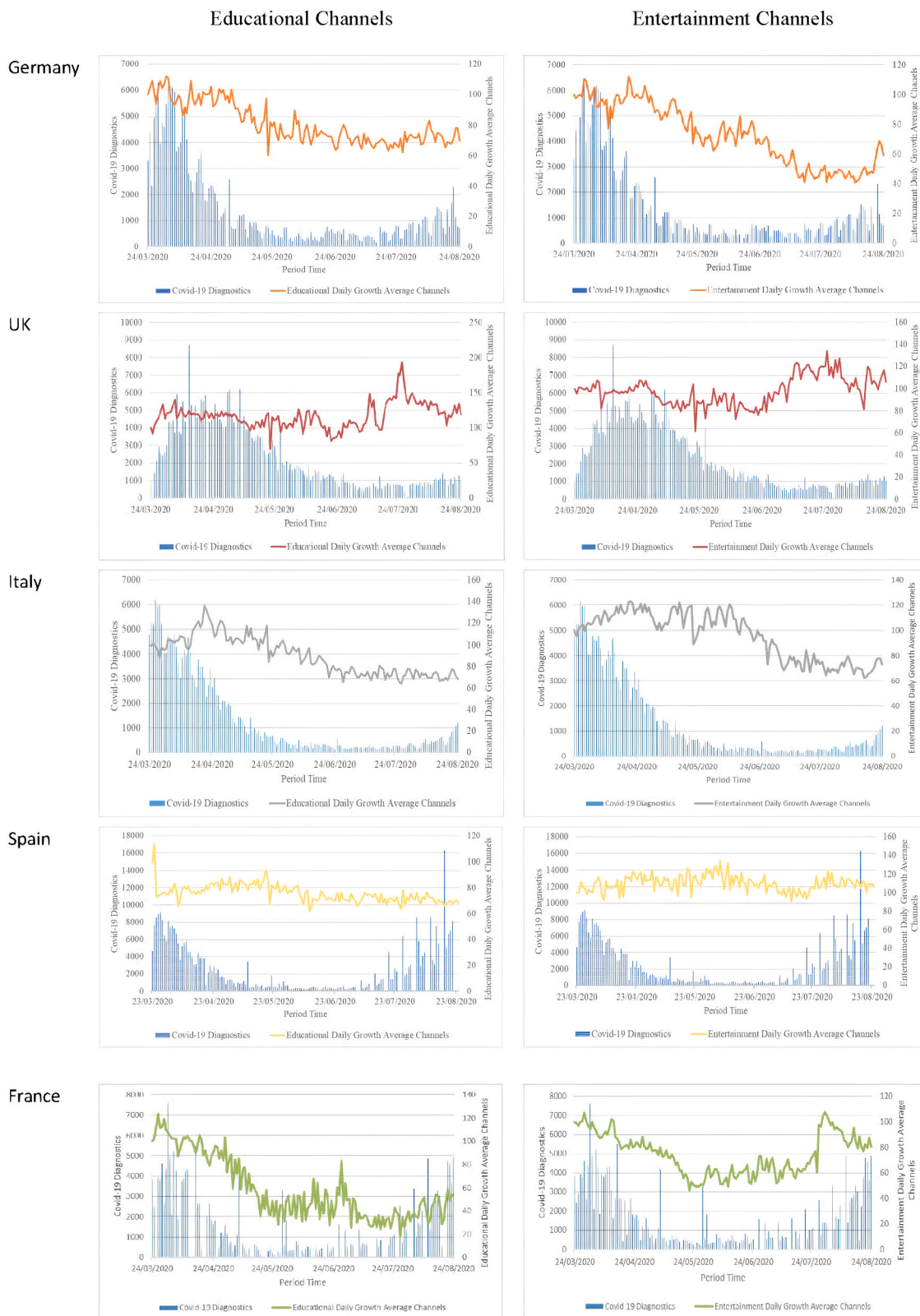
Fig. 2. Top 10 videos.



Graph 1. A) Video on Demand indicator analyzing Europe's digital performance about DESI B) Social Networks indicator analyzing Europe's digital performance about DESI.



Graph 2. Distribution of total views of the sample.



Graph 3. Evolution of star channels during the health crisis and comparison to diagnoses of COVID-19 by types of channels and country.

(13.9%) and more specifically the series ‘Peppa Pig’ (12.4%), ‘Teletubbies’ (8.4%) and ‘ARPO The Robot’ (7.4%). ‘Masha and The Bear’ is relegated to a lower percentage (4.5%), although its videos occupy the main positions both in visualisations and in fans (see Table 2). The unanimity of the contents that European children like the most allows us

to verify hypothesis 3 (absence of cultural differences), while refuting hypothesis 4 (higher prevalence of educational contents), as all videos provide a playful and non-educational function.

On the other hand, Table 4 presents the most shared verbal contents during the period under analysis, allowing the identification of the



Graph 4. Scatter plot for average educational and entertainment daily growth of channels and COVID-19 diagnoses by country.

topics and terms with the greatest trends during the pandemic. It shows how families, despite being immersed in an international pandemic, do not refer to the covid-19 in the searches carried out by their children. In other words, parents have tried to keep a certain degree of normality in contents related to children. In this way, no slogans or terms related to COVID-19 appear. The word cloud reflects the terms used daily for the parents in order to find cartoons such as 'Peppa', 'Kids', 'Animados', 'Pocoyó', 'Wutz', 'Cartoni', 'Kinder' and 'Masha'. Those terms are related with the content and they are used by parents in order to find the videos. In the same way, they can be found as families use specific keywords as 'cartoons', 'Disney' or 'Peppa' (see Table 4, Most keyword searches) to access the channels preferred by their children.

4. Discussion

The use of social networks during natural disasters and humanitarian crises takes on a unique degree of significance, showing their capacity to both transmit information [55,56] and coordinate actions based on solidarity and cooperation [57]. However, they also maintain their recreational function. The growth of cultural and recreational initiatives, especially in countries undergoing confinement or social restriction measures, shows the need for human beings to maintain their daily lives and overcome their isolation. In view of the results obtained, the consumption of social networks experienced by adults [42] is comparable to that of children under five in Germany, France, Spain, Italy and the UK. Consequently, hypothesis 1 is supported: there has been a growth in children's YouTube channels in all five nations.

Table 3
Channels with the greatest impact in the top 5000.

Channel	Percentage of screen share
ARPO The Robot	7.4
Ben & Holly	2.4, 4.8 ^a
Ben e Holly - Italian	2.4
Ben and Holly's Little Kingdom	
Sing GameVEVO	0.5
Canzoni Per Bimbi.it	0.7
Cartoons for Children	0.7
ChuChuTV English	0.9
Démo Jouets	1.7
Disney	3.0, 15.5 ^a
Disney UK	5.2
disneychannelES	0.3
DisneyChannelIT	7.0
DisneyJuniorUK	1.0
Happy Learning Spanish	2.7
KinderKlubTV	2.1
Children's songs to sing along and move around to	
Madame Récré FR	2.8
Masha and The Bear	4.5
Peppa Pig	6.1, 12.4 ^a
Peppa Pig Deutsch - Offizieller Kanal	6.3
Peppa Pig Italiano - Canale Ufficiale	
Pica - Official Pica	1.7
PJ Masks Super Pigiamini - Canale Ufficiale	5.6
Pocoyo	6.2
Teletubbies - WildBrain	8.4
TiempodeSol	0.6
Toy Trains 4u	3.3
TuTiTu français	2.6
WildBrain - Kids Videos	13.9
Total	100.0

^a Total percentage of channel groups.

Families facing the COVID-19 health crisis have tried to create a friendly climate where the well-being of their children prevails [18,19]. It is therefore logical that there has been a particularly noteworthy increase in children's entertainment channels rather than educational channels, but there are important cultural differences among the countries, confirming hypothesis 3. In line with the desire of families to protect and look after their children, the clouds of words used during this period have no connection whatsoever with the COVID-19 pandemic. By contrast, in previous crises, human beings have used slogans – mainly in the form of hashtags – and carried out searches in relation to the disaster in question by adapting their language [56]. In other words, families do not make any mention of the situation experienced in the use of social networks for their young children. No doubt, parents are active in their personal accounts, as shown by research on the use of social networks during the COVID-19 pandemic [42,58], but they choose to maintain the climate of well-being in the networks consumed by younger members of the family. Families decide to generate a calm atmosphere and offer short videos from YouTube [20–22] related to their children's tastes and needs, for instance lullabies and singing games, with bright colours and scene changes, as indicated by previous studies [22,23]. YouTube appears as a shell institution [24] or a parenting tool [23] that allows for entertainment while being used as a means of behavioural control. In this sense, it is reasonable to conclude that the increased use of social networks has been preferentially for the purposes of entertainment, with the exception of in Germany and Italy, where educational channels have had a greater impact. These results are consistent with Genc [34] in that social networks have an important playful function for those in early childhood.

That the consumption of children's channels grew in the summer time in different nations, coinciding with the summer holidays for children aged 0–5 years (Early Childhood Education), while official diagnoses of COVID-19 were increasing, may reflect the inherent need of parents to protect their children. In this way, on those dates when everyday life would have dictated days of play from sunrise to sunset,

Table 4
Word cloud and most keyword searches.

Word cloud	Most keyword searches																				
<p>Size= word frequency green: many reactions orange: few reactions</p>	<table> <tr><td>Cartoons</td><td>521</td></tr> <tr><td>Disney</td><td>310</td></tr> <tr><td>Peppa</td><td>292</td></tr> <tr><td>Episodes</td><td>247</td></tr> <tr><td>Animati</td><td>234</td></tr> <tr><td>italiano</td><td>230</td></tr> <tr><td>WildBrain</td><td>203</td></tr> <tr><td>Arpo</td><td>199</td></tr> <tr><td>Cartoni</td><td>195</td></tr> <tr><td>Kinder</td><td>191</td></tr> </table>	Cartoons	521	Disney	310	Peppa	292	Episodes	247	Animati	234	italiano	230	WildBrain	203	Arpo	199	Cartoni	195	Kinder	191
Cartoons	521																				
Disney	310																				
Peppa	292																				
Episodes	247																				
Animati	234																				
italiano	230																				
WildBrain	203																				
Arpo	199																				
Cartoni	195																				
Kinder	191																				
*The data acquisition were extracted thanks to the Fanpage application.																					

young children found themselves consuming videos on YouTube. Although consuming videos may not have been the preferred task, previous research indicates that at the age of 6, children's tastes change [35]. At this point they tend to prefer online games and entertainment applications to traditional play [59]. The use and consumption of content through screens involves possible risks, among them, the alteration of the learning system, which may not only generate addiction but also subsequent problems with attention and memory [60,61]. It is therefore necessary to support families by offering them other entertainment and game options that moderate the consumption of their children's favourite channels [61]. In the same way that nations have generated platforms of educational resources and support for education, it is necessary to offer families different options for leisure and free time, which could be carried out in the family nucleus.

However, there are significant cultural differences. On the one hand, in the nations of Germany, France and Italy the growth in the consumption of children's YouTube channels could be partly explained by the spread of COVID-19. In this sense, we can see how nations that considered themselves seriously affected, such as Italy, France and Germany, increased the consumption of social networks among children in a bid to keep them busy and entertained while they were learning. Hypothesis two is thus partially confirmed: the growth in educational channels is not directly explained in all countries: only in France, Germany and Italy. Similarly, there were differences in the growth of educational and leisure channels in these countries, with the latter being more important in France and the former in Germany and Italy. In catastrophic situations, consumption and commitment to social networks varies according to the temporality and proximity of the affected area [45,46]; our results confirm this. However, the strong impact generated by the pandemic and the consequent closure of schools does not explain the growth in educational and leisure channels in countries such as Spain and the UK, which have also been severely affected. The growth has been evident in Western Europe, but it is necessary to ask why the behaviour of people in Spain and the UK has differed. In the first instance we must remember that children aged 0–5 years show a predilection for holding technological devices in their hands [27,28]. This necessarily passes through their psychomotor capacity, as indicated by Montessori [29–31]. The devices need to be small and manageable. In future lines of research it is necessary to study the data presented by DESI [44], as there could be behavioural patterns between Spain and the UK, given that they exhibit inferior indicators of digital competitiveness in terms of the 5G readiness indicator, while the consumption of the video on demand and social network indicators is higher in these nations than in their Western European counterparts. Furthermore, the cultural differences highlighted may be the result of the diversity of political actions. In the specific case of the UK, actions have differed from their European counterparts during the management of the health crisis. In the same way, the communication model of nations can vary depending on the political position of their governments [1–4,16,17].

5. Conclusions

The consumption of early childhood channels continues to show growth, reflecting the policies of confinement of the population and/or measures of social distancing. Therefore, those nations with a higher degree of awareness have increased the consumption of children's channels to a greater extent. Families in these cultures, faced with growing numbers of COVID-19 diagnoses, use the social network YouTube as a tool for the playful raising of their children, regardless of the summer season, summer holidays or the opening of swimming pools and parks. YouTube has been structured during this health crisis as an effective ally to mitigate the lack of outdoor play, trying to protect the mental health of the youngest members of society. However, the excessive use of this network can lead to problems in the medium or long term. This is why it is necessary to support and offer families other options beyond the screen, allowing children to play and explore their

environments, taking into account the need for physical exercise [62].

Credit author statement

Raquel Lozano Blasco: Conceptualization, methodology, software and writing. Alberto Quilez-Robres: Visualization and supervision. Diego Delgado Bujedo: Data analysis and final and draft preparation. M^a Pilar Latorre-Martínez: Supervision, validation and writing.

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Appendix A. Supplementary data

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